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ONTARIO

# Medico-Legal Branch

Department of the  
Attorney-General of Ontario

TORONTO

Printed and Published by

T. E. Bowman, Printer to the King's Most Excellent Majesty

1943





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Ontario. Attorney-General's Department-

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# Medico-Legal Branch

Department of the  
Attorney-General of Ontario

Compiled by

CECIL L. SNYDER, K.C.,  
Deputy Attorney-General of Ontario

*To the Law R.R. University of  
Toronto.  
from W. S. L. Kennedy.*

TORONTO

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# Medico-Legal Branch



## CONTENTS

|                                | PAGE |
|--------------------------------|------|
| Foreword.....                  | 5    |
| Preface.....                   | 7    |
| Medico-Legal Officials.....    | 9    |
| Medico-Legal Laboratory.....   | 13   |
| Preservation of Specimens..... | 15   |
| Post-Mortem Examinations.....  | 16   |
| Witness Fees.....              | 22   |



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## FOREWORD

It has been considered desirable to prepare this booklet for the convenience and assistance of those engaged in the administration of justice in Ontario. The object is to make known the highly qualified persons attached to the Medico-Legal Branch of the Attorney-General's Department who are available in this Province to assist officers of the Crown in law enforcement. There is also included informative material for the guidance of those engaged in this important work.

I heartily commend this book to the attention of all who give serious thought to the problem of crime and the apprehension of offenders and it is, therefore, a pleasure to authorize its publication.

G. D. CONANT,  
*Premier and Attorney-General*

March, 1943





## PREFACE

A year ago, following the death of Dr. E. R. Frankish, the Medico-Legal Branch of the Department of the Attorney-General of Ontario was reorganized. Under the supervision of permanent officials of the Attorney-General's Department the work of the Medico-Legal Branch has been more widely distributed and local law enforcement officials have been aided and guided by the District Pathologists attached to this Branch.

A very high standard in medico-legal work was established by the late Dr. Frankish who was medico-legal expert of the Attorney-General's Department for nine years. During this time Dr. Frankish assisted in the investigation of important criminal matters wherever they arose throughout the Province of Ontario. He was almost exclusively engaged in medico-legal practice for the Crown during that period in making autopsies and laboratory investigations and in giving evidence in the courts of criminal jurisdiction. Not only was Dr. Frankish a pathologist but also a keen investigator whose advice was invariably sought by police officers assigned to a difficult case. In addition, he was the outstanding expert on ballistics in this Province. His untimely passing has been regretted and deplored by everyone engaged in the administration of justice.

It was formerly the custom to call upon the medico-legal expert to assist in a criminal investigation anywhere in the Province. The reorganization of the Medico-Legal Branch has been such as to relieve any one official from such heavy widespread responsibilities. It has been found quite satisfactory for Ontario Provincial Police or local municipal police to consult with the local Crown Attorney and, in a case of homicide, to benefit by the assistance of a District Pathologist. In perplexing problems the local police have an opportunity of seeking the advice and assistance of the Criminal Investigation Branch of the Ontario Provincial Police. Crown Attorneys, likewise, have the advantage of being able to consult with members of the Attorney-General's Department. The Consulting Pathologists, both of whom have had a wide and varied experience in criminal matters, welcome requests from the District Pathologists for assistance and advice.

Local law enforcement officials are advised to consult, when necessary, with the nearest District Pathologist. Inquiries directed to permanent officials and to the consulting staff in Toronto will receive every attention.

This booklet is intended as a directory and guide to those engaged in the administration of justice in Ontario and has been prepared with a view to encouraging the full use of the facilities provided.

C. L. S.





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### District Pathologists

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- |                                 |  |
|---------------------------------|--|
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| Windsor<br>District             | <p>DR. S. M. ASSELSTINE, Pathologist, Windsor Hospitals.</p> <p><i>Office:</i> Medical Arts Building, Windsor;<br/>Telephone, 4-3221.</p> <p><i>Residence:</i> 2105 Victoria Avenue, Windsor;<br/>Telephone, 3-7043.</p>   |



## MEDICO-LEGAL LABORATORY

Scientific assistance is becoming ever more valuable in the investigation and solution of criminal problems. A properly appointed medico-legal institute is one of the main prerequisites. Police forces should have at their disposal the best that science can offer to aid in the detection of crime and the apprehension of offenders. Obviously a police officer cannot undertake scientific experiments nor is he expected to do so but a knowledge of how to solicit help from scientific fields is of vital importance.

The scope of the medico-legal branch is wide and varied in character. The laboratory deals with the medical and chemical problems of criminal investigations and correlates medical knowledge with the skill of the chemist and analyst. Not only medicine and chemistry but anatomy, pathology, materia medica, botany and bacteriology are all intimately bound up in this interesting branch of forensic science.

Numerous and diverse are the tests carried out in the laboratory of the Medico-Legal branch of the Department of the Attorney-General of Ontario, which is located at 11 Queen's Park, Toronto. All articles submitted to this department are examined with meticulous care and no detail is considered too insignificant when probing for information. The tests in particular are listed as follows:—

### Firearms

Various tests are undertaken to estimate the distance, the scorching or burning and the explosive effects of firearms, also the comparison of mortal and test bullets and the photography of these if the comparison is favourable.

### Alcohols

Samples of blood, urine, stomach contents are analysed to determine their alcoholic content in cases of reckless driving, assaults, manslaughter, and murder.

### Poisons

Viscera, blood, urine, gastric contents and food materials are examined to detect the presence of any poisonous substance.

### Carbon Monoxide

Carbon monoxide analyses of blood are carried out using a precise Reversion Spectroscope in certain cases such as coal gas poisoning and accidental deaths or suicides in motor cars.

### Cyanide

Blood is tested for cyanide in deaths resulting from improper fumigation methods and also suicides.

### **Blood Stains and Grouping**

Examinations are made on clothing, weapons, debris, scrapings from cars for human blood stains and the blood group determined, if possible.

### **Assault Cases**

Suspicious stains on articles of clothing are examined for the presence of spermatozoa and human blood.

### **Hairs and Fibres**

Hairs and fibres found on weapons, garments, shoes, motor cars are examined microscopically and compared with samples from the victim and the accused.

### **Oil and Grease**

Chemical tests detect the presence of oil on the hands of a man who is shot while allegedly cleaning his gun—rather a decisive factor in differentiating between accidental death, suicide and murder. Rags and clothes, saturated with kerosene, are tested in cases of suspected incendiarism.

### **Broken Parts from Cars**

Broken glass from the headlights of a car or broken metal fragments, picked up at the scene of an accident, are fitted together if possible and may form a strong link in the chain of evidence against suspected persons especially hit and run drivers.

## PRESERVATION OF SPECIMENS AND CLOTHING

### Poison Cases

In all cases it is imperative that the pathologist, coroner and police constable make careful notes so that the record of evidence submitted to the court may show the sequence and time of events. When the coroner has reason to suspect poisoning and desires to have the stomach or other organs analysed, neither alcohol, formaldehyde nor any other preservative should be used to preserve the specimens. They should be placed in glass jars with glass tops, the jars must be thoroughly washed with clean water—no soap or cleanser should be used. All specimens should be sealed with a distinctive seal, labelled and delivered in person by a trustworthy constable. The label on each jar should bear the name of the deceased, the name of the organ contained therein and the pathologist's signature. If the deceased was under a physician's care, a history of the case should be forwarded for the assistance of the analyst. The following is the proper procedure:

1. The pathologist should reserve for analysis the stomach, duodenum and three or four feet of intestines. The pathologist, if he wishes, may open the stomach and bowel to examine the mucosa, then he may place the contents and opened organs all together in a thoroughly clean glass jar.
2. Both kidneys and a large section of the liver, if not the whole organ, should be placed in another jar. In suspected arsenical or mercurial poisoning the whole liver should be submitted for analysis.
3. All available urine should be collected in a separate bottle.
4. At least two ounces of blood should be placed in a clean bottle which can be tightly stoppered, preferably with a glass stopper.
5. In cases where it is probable that an abortion has been produced by introduction of a foreign substance into the uterus, the contents should be preserved in a clean jar. After opening and examining inside of the uterus, the whole specimen should be placed in a separate clean container.
6. In all poison cases any tumbler, spoon or bottle, even though such may appear to be clean and empty, should be wrapped up and forwarded to the chemist for analysis.

### Clothing for Examination

In cases of assault, gun shot wounds, clothing to be examined for suspected blood stains, etc., each garment should be wrapped separately, sealed, tagged and delivered to the medico-legal laboratory along with a complete resume of the case under investigation.

### Hairs, Fibres and Debris

Any hairs, fibres or particles of debris, found at the scene of a crime, should be placed in clean envelopes, sealed, labelled and delivered to the laboratory. Sometimes such trifling clues play a vital part in the solution of our criminal problems.



## SUGGESTIONS FOR THE CONDUCT OF MEDICO-LEGAL POST-MORTEMS

There will be no attempt to exhaust the subject of medico-legal post-mortems, nor in any way to go into the detail of methods of procedure, but rather to outline some of the important phases of this subject applying more particularly to cases in which legal action may follow.

Medico-legal autopsies are different from ordinary autopsies in that they may lead to serious legal actions. Therefore, we feel that the pathologist, in his conduct of the autopsy, must anticipate all possible angles that might develop in the case when it reaches Court. If he is retained by the Crown he is independent of prosecution or defence, and must be prepared to help the Court to the limit of his knowledge. He must look upon the autopsy as disinterestedly as possible and make a very complete and thorough examination, and a record of all his findings. If defence counsel at a later date wishes to consult with him on his findings he is at liberty to do so, having in mind that what he has said in private may later be disclosed in court.

We recommend very highly that blocks of tissue be taken from all organs and, in some cases, the whole organ itself should be kept. We also recommend that all brains be removed in toto and placed in 10% formalin for ten days before being cut. We must ever keep in mind the possibility of a civil suit arising out of the case at a later date.

### Identification:

*Direct Identification:*— It is absolutely essential that the body be properly identified either before or after the post-mortem to the Pathologist doing the autopsy. This may be a direct identification to the Pathologist by a near relative or one who was well acquainted with the deceased. This identification should be made in the presence of a third person, preferably a police officer.

*Secondary Identification:*— The body may be identified to the Pathologist by some one person who was present at the first identification, or who can be depended upon to be present at the identification to be made after the post-mortem. In cases where it is impossible to get an identifier photographs and finger prints may be taken.

Sometimes the body may be identified to you merely as being one found at such and such a place, at such a time. In lieu of a better or more direct identification this must be accepted.

*Age:*— One might put down the stated age and then at the inquest or trial comment on the fact as to whether the deceased looked the stated age, older or younger.

After the "hours after death" make a note at what hour the autopsy was started.

The length of the body should be put in feet and inches. The weight, in the majority of cases, has to be estimated. In some cases, as in death from suspected starvation, it is essential to have the actual weight determined.

*Hair*:— If there is any question as to the identity of the deceased, one would be well advised to take a sample of hair. In suspected homicide cases it is well to examine the hands and nails for bits of tissue and hair of the assailant.

*Teeth*:— Examination of the teeth is largely for identification purposes and under such circumstances should be carefully made. They should also be examined carefully in cases of abortion as a possible source of infection of the uterus.

*Skin*:— The items to be noted under this heading are fairly obvious and require no elucidation. Rigor mortis, post-mortem staining, and decomposition also require no comments.

#### External Marks of Violence:

We have no hesitancy in stressing the importance of external marks of violence, even to the most insignificant bruise. These, in themselves, may not be of a serious nature, but may indicate a struggle or "beating up" etc. Many bruises are not apparent or may appear very insignificant on the surface, but on section through the skin are seen to be deep haemorrhages. All such bruises should be properly located anatomically in reference to fixed points on the body.

Bruises of the lower legs should be located in reference to their height above the bottom of the heel. This refers particularly to automobile accidents where the question of a bumper injury may come in. Other bruises may be located in a more general way. The underlying injury may be much more serious than indicated by the surface bruise. If possible, one should endeavour to determine from the bruise and the depths of the injury, the character of the blow, i.e. whether it was a light slapping blow producing a superficial injury, or a crushing blow producing deep injuries.

One must note the shades of colour of bruises as an indication of their age. Of course, the difficulty of distinguishing between bruises produced just prior to death, and those within two hours after death, is recognized by all. Brush burns and the direction of their lines are important as indicating the direction of a glancing blow, or the movement of the body on a rough surface.

*Lacerated Wounds*:— Lacerated wounds should be most carefully located on the body. This may be done by locating one end of the wound to some nearby fixed point on the body, and then the wound is described as running from this point in such and such a direction for a measured distance and width. The edges must be carefully noted as to whether they are bruised, irregular, or clean cut, having perpendicular, slanting or undermined edges, indicating to your own mind possibly the character of the instrument used. In cases of knife wounds, the character of each end of

the wound is important, viz., which end of the wound starts abruptly or is trailing off. This gives some indication of the direction of the sweep of the knife. In cases of stab wounds it is extremely important to get, first, the location and direction and size of the surface wound, and then the direction and the depth of the penetration wound, giving angle to at least two planes of the body.

#### **Gunshot Wounds:**

Gunshot wounds should be located in relation to some fixed point of the body from the centre of the wound. Next, the size and the shape of the wound must be noted, then the character of the edges, as to whether there is burning of the skin or singeing of the hair about it. Next the spread of the powder, burnt or unburnt should be measured. A very careful measurement of the area covered by the burnt or unburnt powder should also be made.

*Line of Fire:*— In determining the course of the bullet through the body we suggest two methods. One, that the wound of entrance be first located on the surface of the body by measuring from either the bottom of the heel, or the top of the head to the centre of the wound, and then measuring out from the centre line of the body in either direction to the centre of the wound. The wound of exit can similarly be plotted. In the case where there is no wound of exit, the final resting place of the bullet may be located in this same way. In many cases it is advisable to cut out the section of skin including the wound of entrance for later chemical and microscopic analysis. To make these measurements the body should be laid out on a flat smooth surface and measurements taken from right angle boards held at either the top of the head or the bottom of the feet. As another method for plotting out the course of the bullet we would suggest that after the body has been opened and the bullet itself located, a small steel rod be passed along the course of the bullet from the wound of entrance to the wound of exit, as near as possibly can be determined, and from this steel rod angles be measured with an instrument to at least two planes of the body, namely, the transverse, sagittal and horizontal planes.

#### **Bullet:**

The bullet, when located, should be handled very carefully, avoiding the use of any instruments to pick it up. It should be washed free of blood, and it may be advisable to put some tiny identification mark on its base, such as a small cross or your initials, produced by a sharp knife, and then it should be wrapped in cotton batten and kept in a box.

The bullet should be kept by the pathologist and delivered either directly by him to the ballistics expert or delivered to a police officer who will himself deliver it to the ballistics expert.

#### **Burns or Scalds:**

These should be plotted out very carefully on the diagram and their degree and extent noted. Blocks of tissue should be taken from the edge of one or more of the burns for microscopical study.



### Clothing:

A careful inspection of the clothes should be made before they are removed from the body, as well as later, looking for dirt marks and tears which might indicate a struggle, or bullet holes and powder burns, and then they should be turned over to the detectives for safe keeping and further examinations by the textile expert.

### Internal Examination:

The procedure from now on is practically that of an ordinary post-mortem examination. Some things, however, probably carry more weight in a medico-legal case than they do in an ordinary hospital case. For instance, the character of the blood, whether it is dark or bright red, fluid or clotted. The condition of the heart chambers, whether they are dilated or not. The coronary arteries, of course, should be examined in all cases and should be examined by making serial cross sections of them with a sharp knife. In cases where thrombosis is present this procedure leaves the thrombotic material in situ, and enables you to later make microscopic sections of it.

*Examination of the Respiratory System:*— If death from asphyxiation is suspected, the mouth, larynx, trachea and bronchi should be carefully examined for any foreign material that may be occluding the lumen, such as vomitus etc., or for evidences of bruising about the throat. Puncture wounds of the lung, or tears of the lung at the hilus, should be looked for in crushing injuries of the chest, to account for haemorrhage into the pleural cavities.

*Examination of the Peritoneal Cavity:*— If there is a peritonitis, the source of the infection of course must be carefully searched for. In cases of ruptured bowel from a blow on the abdomen look carefully for a hernial sac as very often this is the point of "blow-out" in the bowel.

The stomach contents should be examined to determine the state of digestion, as a means of determining, in some cases, the time of death.

The liver, gall bladder, pancreas, spleen, kidneys and suprarenals just require the usual routine examination. In the case of the bladder one should look carefully for possible ruptures and, in fractures of the pelvis, a rupture of the urethra.

*Generative Organs:*— The chief problem here is that of abortion. In sudden deaths in women the possibility of air embolism from attempted abortion must be thought of at once. To demonstrate this, open up the abdominal and chest cavities with as much care as possible so as to avoid opening up any more vessels than necessary and, very carefully, by blunt dissection, expose the inferior vena cava. In cases of air embolism myriads of bubbles of gas can be seen through the thin wall of this vein. The bubbles of gas can usually be seen in the large veins of the uterus itself. Next, open the right heart in situ. This may be done under water to demonstrate the air if desired, but usually is readily demonstrated by simple opening into the right ventricle with a pair of scissors. In well marked cases the left ventricle will collapse suddenly with a puff of air coming out through the opening; in others it may appear just as fine

bubbles of air mixed up with blood clot. The possibility of other substances being injected as well as the air must be thought of, and remains of soap and oil mixtures are sometimes found. One is well advised to keep blocks of lung for frozen sections and fat stains with the possibility of demonstrating fat emboli. If such are found then, of course, the site of injection in the placenta should also be examined for this same material. Next, remove the uterus, tubes and ovaries, with as much vagina as possible, in toto. Then very carefully, with a pair of blunt scissors, open up the uterus anteriorly through the cervix, and examine first for any air that may still be trapped in the uterine cavity, as well as other obnoxious substances. Any foreign fluid materials should be collected for further examination. Then carefully look for the site of separation of the placenta through which the air has got into the general circulation. A possible line of defense in such cases is post-mortem B. Welchii gas formation. It is important, under these circumstances, to know how long after death the post-mortem was started, and in such suspected cases it is advisable to do the post-mortem as soon after death as possible. Then careful examination of the separated placental site should be made for signs of inflammation.

In cases of post-abortion septic endometritis careful bacteriological examination should be made of the whole body, first, to establish the organism causing the infection and, second, to eliminate all internal foci of infection from which the uterus may have secondarily been infected. The sinuses of the head, the teeth, the tonsils, as well as the lungs, heart, gastro-intestinal tract, genito-urinary tract, rectum, anus, and perineum, should be very carefully examined for focal points of infection that may be suggested to you as being the origin of the endometritis. Lacerations and perforated wounds of the vagina, cervix and the uterus should be carefully searched for. Cultures should be taken from the uterine cavity before opening it then, later, cultures of the tubes should also be made. If possible, the method of spread from the uterine cavity to the abdominal cavity should be determined.

*Brain and Head:*— Subcutaneous bruises of the scalp should be noted as indicating the site of a blow.

*Meninges and Blood Vessels:*— In head injuries the extent and location of the haemorrhages should be carefully noted.

*Middle Ears and Nasal Sinuses:*— In all cases these should be opened up and examined.

*BRAIN:*— As stated before, the brain should be removed in toto and fixed for ten days in 10% formalin before examination, then a horizontal slice should be made through it at the level of the corpus callosum. A sagittal slice should then be made through the lower half separating the frontal lobes, and extending through the pons and medulla. For most purposes this is sufficient to demonstrate the inner parts of the brain. The spinal cord itself is only removed in cases where there is a suspected injury of the cord. This can be done either from within the body cavity by use of an electric saw, or from the back by cutting the transverse processes with a double bladed saw or a chisel.

*Skull and Osseous System:*— In severe motor accidents all fractures should be carefully noted on the chart and one should particularly look out for fractures of the pelvis in motor accidents, as well as those of the skull and the ribs. Where there are fractures of the lower legs the height of the fracture above the bottom of the heel should be noted as it might be a bumper fracture. It is advisable in all motor accidents, whether the deceased is a pedestrian or the driver of the car, to take a sample of blood and have it tested for alcohol, providing death did not occur too long after the accident.

**Reports:**

It is well to keep your original report which you have made out yourself, and send to the Crown Attorney, or produce in Court, a typewritten copy. Your original report, with all data pertaining to the case, should be kept in a separate file and notes of extra work done, or consultations, etc., should be kept in the file with this report. You may take your original report into the witness box with you to refresh your memory in giving evidence.

W. I. R.



## WITNESS FEES

### At Criminal Trials.

Barristers and solicitors, physicians and surgeons, engineers, chartered or incorporated public accountants, surveyors and architects are entitled to a witness fee of \$5.00 per day when called upon to give professional evidence. Members of the medical profession are ordinarily entitled to a witness fee of \$5.00 per day when called upon to give evidence in consequence of any professional service rendered by them, or to give professional opinions. (The Rules of Practice and Procedure of the Supreme Court of Ontario, 1942, page 226.)

Under certain circumstances, however, a member of the medical profession is entitled to an expert witness fee. Such expert witness fee is generally fixed at \$30.00 per day. Those attached to the Medico-Legal Branch of the Attorney-General's Department, other than full time employees of the Ontario Government, are entitled to such expert fee for giving evidence in a criminal matter, both at a preliminary hearing and at a trial. Before such expert witness fee may be allowed authority for so doing must be obtained by the Crown Attorney from the Department of the Attorney-General. Requests for this authority should be directed to the Deputy Attorney-General.

In addition, a reasonable sum may be allowed under certain circumstances to pay for special services rendered by one called as an expert witness in a criminal matter. It frequently occurs that considerable laboratory or other preparatory work is necessary before an expert witness is able to give evidence. The Crown Witnesses Act gives authority to a Judge, generally on recommendation of Crown counsel or the Crown Attorney, to grant a reasonable sum for such work in addition to the expert witness fee. See Section 2 of the Crown Witnesses Act, Revised Statutes of Ontario, Chapter 142, which provides as follows:

"(1) The Judge may grant to any person who attends at the instance of the Crown to give evidence, an order for the payment of such sum as seems reasonable and sufficient to compensate the witness for his costs and charges in attending as such witness; but such sum shall not exceed the amount payable in civil cases in the Supreme Court.

(2) The Judge may include in his order such sum in addition to ordinary witness fees as he may deem reasonable and sufficient to compensate any witness by whom a plan has been prepared or any other article furnished or work done for use at the trial for his costs and charges in preparing such plan or other article or doing such work.

(3) A special fee may be paid to an expert witness upon the fiat of the Attorney-General."

A member of the Medico-Legal Branch called to give evidence at a place other than his place of residence is also entitled to reasonable living expenses while necessarily absent from his home and actual first-class railway fare or its equivalent.

The Consulting Pathologists, the Consulting Chemist and the District Pathologists are entitled to the expert witness fee and transportation and living expenses set out above. Fee for expert evidence on ballistics, handwriting and other matters will be fixed for the particular case by the Attorney-General's Department upon notice to the Deputy Attorney-General.

#### At Inquests.

Members of the medical profession are ordinarily entitled to a witness fee of \$5.00 for attendance at an inquest. See Section 21 of The Coroners Act.

Fees for special services and expert witness fees to certain witnesses who give evidence at a coroner's inquest are dealt with in Section 18(1) and Section 20 of The Coroners Act which follow:

"18. (1) (Fees for special services) The coroner may grant to any person who attends and gives evidence at his instance, such sum in addition to ordinary witness fees as he may deem reasonable and sufficient to compensate the witness for preparing a plan, furnishing any article or doing any work for use at the inquest, for his costs and charges in preparing such plan, furnishing such article or doing such work, and upon the fiat of the Attorney-General may direct the payment of a special fee to an expert witness.

20. (Expert witnesses) The coroner may, with the sanction of the Crown Attorney, summon one or more, but not exceeding three, persons for the purpose of giving expert evidence, and any person so summoned shall be paid for his attendance in addition to his actual travelling expenses such fees as the coroner may certify to be reasonable, not exceeding \$15 a day, and such fees and expenses shall be paid on the order of the coroner in the same manner as the other expenses of witnesses."

Members of the Medico-Legal Branch of the Attorney-General's Department are entitled to fees as set out above. A medical witness attending to give evidence at a coroner's inquest is also entitled to mileage at the rate of fifteen cents per mile for every mile necessarily travelled.

## MEMORANDA











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